

REMARKS

Claims 1-4, 7 and 27 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Mamoru et al. (JP '376). The grounds for rejection remain the same as set forth in the previous Office Action.

Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '376 in view of U.S. Patent 6,215,234 to Abe et al. The Examiner relied on Abe et al. as teaching a spark discharge gap of 0.2mm to 0.4mm within the scope of the rejected claims.

Claims 8-12, 15, and 21 and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '376 in view of U.S. Patent 6,045,424 to Chang et al. Chang et al. was cited as teaching a spark plug having an igniter tip made of a noble metal having a mean crystal grain diameter of 250 microns, citing column 5, lines 36-37. The reason for rejection was that it would have been obvious to modify the spark plug of JP '376 to have a tip having an average crystal grain diameter of more than 50 microns so as to provide a spark plug with a more robust tip as taught by Chang et al.

Claims 13 and 14 stand rejected 35 U.S.C. § 103(a) as being unpatentable over JP '376 in view of Chang et al., further in view of Abe et al. The Examiner relies on these two secondary references as teaching the claimed discharge gap and crystal grain size.

Each of the rejections relies on JP '376 as a primary reference.

In the Response to Arguments at pages 9-10 of the Office Action, the Examiner was of the view that the claim amendment of November 10, 2003 did not structurally distinguish over JP '376. Particularly, although acknowledging that the claims recite that a portion of the igniter is fixed to at least one of the center electrode and ground electrode via a weldment, the Examiner

considers this limitation to be met by JP '376 in which igniter 18, 19 is welded to the ground electrode or to the center electrode, citing [0019] and [0032].

The Examiner further disagreed with Applicants' assertion that JP '376 has no portion corresponding to the claimed igniter. In this regard, the Examiner considered that the igniter of JP '376 is formed of elements 18 and 19 which are welded to the ground electrode 14, such that JP '376 discloses both the claimed igniter and the claimed weldment.

Along the same lines, the Examiner did not consider persuasive the argument that the claimed oxygen content is directed to the portion of the igniter that is not fused, because such limitation is not expressly recited in the claims.

Applicants traverse, and respectfully request the Examiner to reconsider in view of the amendments to the claims and the following remarks.

An important feature of the present invention, as now defined in amended claims 1, 8, 23 and 25, resides in that igniter 31 or 32 includes (1) an igniter section composed of a metallic material whose principle component is one of platinum and iridium, and (2) a weldment section W1 or W2 distinct from the igniter section and composed of the metallic material of the igniter section and a material of the one of the center electrode and the ground electrode. As claimed in claim 1, the igniter section includes an oxygen content of not more than 120 ppm. As claimed in claim 8, the igniter section comprises a crystal grain of more than 50 μm in mean diameter, and includes an oxygen content of not more than 300 ppm. The igniter having such an igniter section is advantageous because not only does it have good resistance to peeling and sweating, but also exhibits good stability in maintaining its quality.

In contrast, the noble metal alloy electrode 13 of JP '376 corresponding to igniter 31 or 32 in the spark plug of the invention is formed as follows. First, an electrode base material 11 made of a first metal having good corrosion resistance is prepared. Second, a noble metal material 18 made of a second material having good resistance to wear or exhaustion due to spark discharge is prepared. The electrode base material 11 and noble metal material 18 are heated to melt the same and solidified to form the noble metal alloy electrode 13. The noble metal alloy electrode 13 is thus composed of the first and second materials.

Accordingly, the igniter section of the present invention composed of a metallic material whose principle component is one of platinum and iridium differs from the noble metal alloy electrode 13 of JP '376 formed of the fused material of electrode base material 11 and noble metal alloy electrode 13 (i.e., composed of the first and second materials). Rather, noble metal alloy electrode 13 corresponds to (2) weldment section W1 or W2 of the spark plug of the present invention, and is entirely missing igniter section (1). The spark plug of the present invention having igniter 31 or 32 including an igniter section distinct from the weldment section enjoys enhanced stability and therefore better resists peeling and sweating as compared to that of JP '376.

That is, JP '376 fails to disclose an igniter having both an igniter section and a weldment section as claimed, and none of the secondary references cures the deficiencies of JP '376.

Additionally, Applicants respectfully request rejoinder of the withdrawn method claims 23-26, including independent claims 23 and 25 upon indication of allowable product claims. Claims 23 and 25 include all of the limitations of the spark plug as claimed in claim 8 (a crystal

AMENDMENT UNDER 37 C.F.R. § 1.111
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grain or more than 50 μm , and an oxygen content of not more than 300 ppm). See MPEP § 821.04.

Withdrawal of all rejections and allowance of claims 1-15, 21, and 23-26 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

Respectfully submitted,

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